

## Analysis & Recommendation

### Fish consumption - Animas River

#### Public Recommendation

The Colorado Department of Public Health and Environment recommends that eating trout from the Animas River at this time is considered safe. CDPHE analyzed fish tissue from rainbow and brown trout from the Animas River. Based on the limited samples available, most of the post event fish tissue analyzed showed metals below detectable levels and all results fall below risk screening levels. Because there is a potential for the fish to concentrate metals in their tissue over time, CDPHE and CPW will continue to monitor levels of metals in Animas River fish. New data will be analyzed and the results will be reported when available.

#### Analysis and Rationale for Recommendation

Ten fish were collected from the Animas River downstream of Durango. Five brown trout ranging in size from 13 inches - 20.6 inches (weights ranged from 13.9 to 62.6 ounces) were submitted and five rainbow trout ranging in size from 11 inches - 13.8 inches (weights ranged from 8.7 to 15 ounces). The fish were filleted and muscle (fillet) samples submitted to the CDPHE Laboratory Services Division (LSD). Fish tissue from the ten fish were analyzed for 13 metals including beryllium, arsenic, selenium, cadmium, lead, uranium, aluminum, cobalt, copper, manganese, nickel, zinc and mercury. Data from all parameters came back less than the detection limits except for samples of mercury, selenium and arsenic.

WQCD consulted with its' Fish Consumption Advisory Technical Advisory Committee (FCA TAC), which consists of members from the Water Quality Control Division, Disease Control and Environmental Epidemiology Division and Colorado Parks and Wildlife. Detectable metal levels were compared to EPA Regional Screening Levels (RSL) in a manner similar to risk assessment of water and sediment from the Animas River. In this case, the mine spill is a short term event and risk assessment generally focuses on short term health effects.

**Mercury:** CDPHE uses a threshold of 0.3 mg/kg to evaluate whether a Fish Consumption Advisory (FCA) is warranted. Mercury is currently the only toxin which Colorado evaluates in fish tissue, has established a threshold and issues FCAs. We also evaluated the data against a more stringent EPA RSL of 0.15 mg/kg, which is a non-cancer screening threshold. Mercury in the 10 fish ranged from <0.02 mg/kg to 0.093 mg/kg. All levels were below both thresholds and we have no concerns at this time with mercury in the fish tissue.

**Selenium:** All selenium results were reported above the detection limit. We evaluated the data against the EPA RSL of 7.7 mg/kg. All data reported was well below 7 mg/kg, in fact, it was all below 1 mg/kg (0.38 mg/kg - 0.58 mg/kg). We have no concerns at this time with selenium in the fish tissue.

**Arsenic:** Fish tissue samples are analyzed for total arsenic. It is generally considered that organic arsenicals are substantially less toxic than the inorganic forms. As a result, fish consumption advisories for organic arsenic are not generally issued by the state and federal agencies. However, the EPA has developed screening level fish consumption limits for inorganic arsenic. The general consensus in the literature is that 85% to >90% of arsenic found in edible portions of marine fish and shellfish is organic arsenic and that approximately 10% is inorganic arsenic. A screen of organic to inorganic arsenic ratios in Colorado fish supports the use of the assumption that fish arsenic levels are composed of less than or equal to 10% inorganic. The default percentage of 10% was applied to the total arsenic results for the 10 fish. The inorganic portion in these 10 fish ranged from 0.006 mg/kg to 0.056 mg/kg. We compared this data to the EPA RSL for inorganic mercury of 0.46 mg/kg. All inorganic arsenic found in the fish (10% of the reported total arsenic) was below this screening level.

The rainbow and brown trout levels of mercury, selenium, and arsenic fall within the range of levels in available Colorado fish previously sampled, and thus, most likely represent background levels and do not indicate a change in fish mercury, selenium, and arsenic levels due to the mine spill.

Thus, CDPHE has recommended that Animas River fish may be consumed without additional health risks due to the Gold King mine spill. As noted in the public recommendation, CDPHE and CPW will continue to monitor fish to examine accumulation and elimination of metals over time. CDPHE will analyze any new data and report out on the results as it becomes available.